Access to Marine and Aquatic Sciences Information in Benin Republic

Coffi Ferdinando Rock Gbedo

Librarian at Benin Institute for Halieutic and Oceanographic Research (IRHOB); Tel: 00229 96355480 E-mail : rockderstein@gmail.com , 03 BP1665 cotonou

Abstract

Information production in our societies is getting more and more expansive. In Benin Republic, marine and aquatic information is produced by many organizations such as Benin Fisheries and Oceanologic Research Institute (IRHOB), Fishery Production Office, Cotonou Port Authority, some laboratories of Abomey-Calavi University, etc. Many of these institutions are working at the national level. The ODINAFRICA program national network was created on the lead of IRHOB. This network is still working today. With the functioning of these institutions, it is clear that a lot of information is being collected on different topics within the domain. All coastal and marine information is being sharing through this network and among all stakeholder and policy decision makers. Regarding the growing information needs of actors in the domain, what do we do to meet the needs of each information seeker? This paper describes tactics used by the library of Benin Institute for Halieutic and Oceanographic Research (IRHOB) not only to follow the national rhythm of information production in the field but also to provide its users with the appropriate information. A lot of information can be found on IRHOB's website: www.nodc-benin.org

Keywords: Benin, marine and aquatic sciences, information access.

Introduction

Oceans and rivers are natural resources that play significant roles in the global population's food security and the development of domestic economy. Fisheries contribute to livelihoods, employment and income with particular importance in coastal communities in developing countries. Around 56 million people are directly employed in fisheries and aquaculture and some 200 along the value chain (FAO).

Oceans and rivers are huge economic development assets for nations. They play preponderant roles in international relations in terms of transports, exportation, importation, tourism and industry. Maritime transport is the bedrock of many national economic activities. It provides raw materials for countries' industrial functioning and ensures the distribution of products or goods emerging from industries. Maritime transport also leads to other means of transport. We have been able to utilize cars, trains and airplanes to carry goods from their manufacturing places through the sea. Rivers also facilitate populations' mobility and fuel economic growth. In Nigeria, for instance, ferry services from mile 2 Apapa and/ or to CMS reduces traffic-jams on road transportation and the slowing down of economic activities.

Oceans and rivers rank among major tourist destinations in the world. They welcome tourists who come either to cruise them or to sojourn on their beaches. In Benin for instance, places like la Bouche du Roy, an outfall between the Atlantic Ocean and Lake Mono in Grand-Popo and Ganvié, a lacustrine village on lake Nokoué, are invaded by thousands of tourists coming from diverse places every year. These activities contribute highly to the economic growth of Benin. In Nigeria, tourism

which maritime transport enhances and facilitates is an avenue through which the states and the federal governments realize revenue that is then channeled to developmental projects. For instance, the Lagos State Government gets substantial revenue per annum from users of beaches like Eleko, Lekki and Taqua Bay. The hospitality business it has encouraged has also made it possible for guest houses, hotels and resort centers which provide employment, as well as rest and entertainment facilities for tourists and others.

Some nations have heavy ocean-based industrial activities. Those activities include sea fishing, oil refinery, energy production, etc.

The fisheries sector occupies a very important place in the socioeconomic development of Benin Republic. It has been recognized as a powerful income and employment generator as it stimulates the growth of a number of subsidiary industries. In countries like Angola, the industrial fishery sector is controlled by Europeans, Chinese, and Koreans. In 2009, the production reached 190, 083 tonnes (FAO Fishstat). The revenues are estimated at 217 millions of US Dollars.

Daily, thousands of barrels of crude oil are produced by offshore petroleum refineries in the world. According to *Oil and Gas Journal*, in the world a total of 636 refineries were operated on the 31 December 2014 for a total capacity of 87.75 million barrels. Engines or mechanical equipment are installed in the sea for energy production. Many policies are then being developed in various countries in the world to cover electricity needs. For example, Greece established wave energy exploitation in the north Aegean in order to guarantee that its numerous isolated islands in the region have access to electricity.

Thanks to ocean and river resources, life has become easier. But anthropic actions are harmful to the marine ecosystem and are source of many other problems. Marine and aquatic species as well as human beings are threatened because of climate change and some fishing practices. Emissions from human activities are changing the ocean's chemestry and temperature. Emissions of carbon dioxide and other greenhouse gases are disrupting oceans conditions and jeorpardizing the future of the essential foods resources we receive from the oceans. They may reduce the amount of wild caught seafood that can be supplied by the oceans and also redistribute species, changing the locations at which seafood can be caught. Other causes of disruption are oil spills from the wrecks of oil tankers. This situation is harmful to the global population because of their dependence on sea foods. Fish and seafood are a primary source of protein for more than one billion of the poorest people on earth. However, these products are getting rare and the global seafood demand is expected to rise by 2050.

These last years, many building and social infrastructures (houses, roads, hotels, etc.) have been destroyed by coastal erosion. This phenomenon is the result of negative effects of human activities on the marine ecosystem. Piracy disturbs the smooth running of economic activities on the sea. In regard of consequences originating from human activities on sea and river, a series of actions have been underaken either to slacken damages or to prevent their occurrence. These actions are conducted by different institutions that handle the catastrophic impacts on sea and rivers (pollution, climate change, fish stock rarity or decline, etc), security and legal issues. They produce informations and also need data to make a decision or solve a problem. Actions need to be taken to monitor information growth and ensure its availability. This paper aims at sharing the strategy used at Benin Institute for Halieutic and Oceanographic Research (IRHOB) to follow the rythm of information production in marine and aquatic sciences in Benin.

Aquatic and Marine Sciences Institutions in Benin

1. Benin Institute for Halieuticand Oceanographic Research (IRHOB)

Known as 'National Oceanographic Committee,' IRHOB was created in 1988 to guarantee the sustainability of marine and lagoon resources. Its objective is to contribute to the effective management of living and non-living aquatic resources in Benin. In term of missions, the responsibilities of this institution are multiple. These responsibilities involve the elaboration of the national fisheries and ocean research programs and ensuring their coordination, implementation and control; the identification of problems whose resolution requires research and training in the field of marine sciences and adjacent coastal areas; the centralization of data; the promotion of the exchange, publication and dissemination of fishery and ocean research results; participation in the elaboration and implementation of regional and international fisheries and ocean research programs consistent with Benin national development goals; research, production, expertise or advice in the respective domains of public and private partners; and contributions to the training and promotion of researchers in marine sciences.

As a research institute, this institution carries out many activities. The most visible are:

- The monitoring of physico-chemical parameters of Benin's marine and coastal waters ;
- The study of the coastal dynamic of Benin littoral ;
- The fish stock assessment through statistic in collaboration with FAO ;
- The demersal fish stock assessment under the aegis of the West African Monetary and Economic Union (UEMOA) in both state members countries and neighboring ones;
- The study of climate and ocean circulation in the Gulf of Guinea (EGEE) within the framework of the International AMMA Program (Multidisciplinary Analysis of the African Monsoon) from 2005 to 2007 ;
- The regional Program of physical oceanography in west Africa (PROPAO) ;
- The creation of a network for coastal measures ;
- The creation of a coastal data bank (temperature, salinity…) and meteorological data accessible on our web site www.nodc-benin.org;
- The supervision of interns and students for their dissertations ;
- The analysis and modeling of the coastal environment, coastal erosion, sea level, sedimentary transport, winds and currents.

Oceans, rivers, etc. and their resources rank among the number one priorities of nations. In Benin Republic, many other institutions deal with oceanographic and lacustrine issues. Some are data producers while others are data users or consumers.

Figure 1. Retrieving beach seine at Cotonou beach by artisinal fishermen.

Figure 2. Sperm whale (seen from front) at the Port of Cotonou.

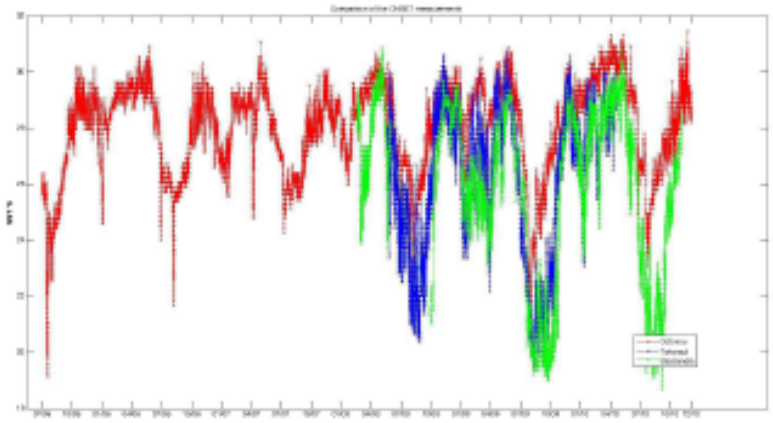


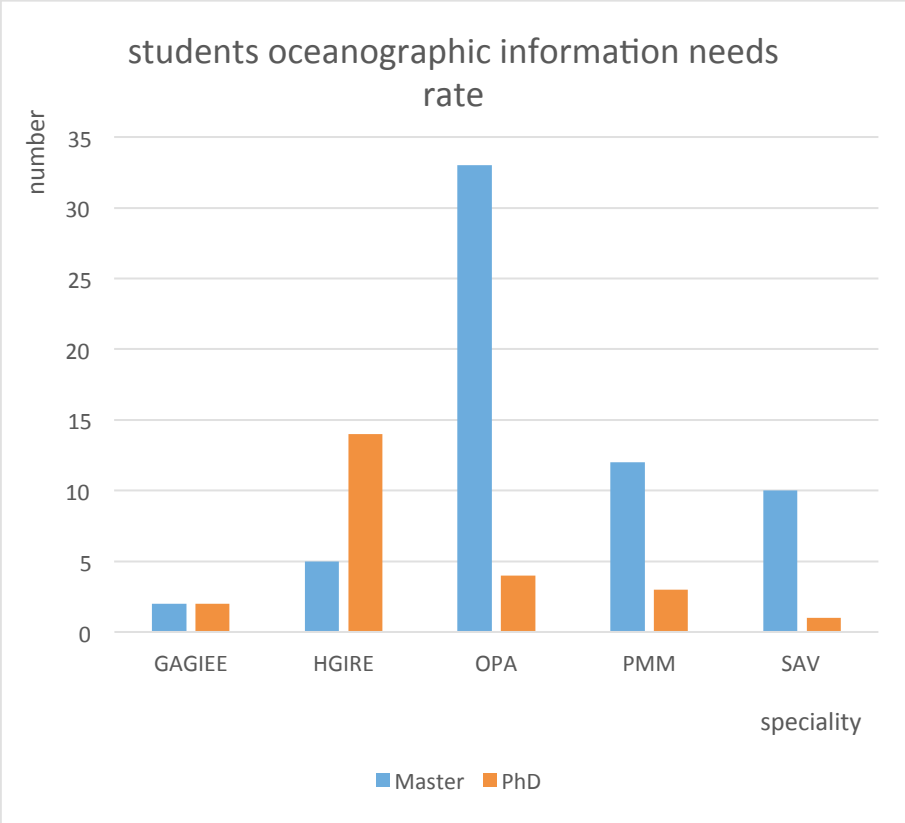
Figure 3. Sea surface evolution 2005-2017.

Figure 4. Data collection on the beach.

Other Organizations in Aquatic and Marine Science in Benin

- Direction of Fisheries Production (DPH)
- Cotonou's Port Direction (PAC)
- Maritime Prefect
- Direction of the Merchant Marine (DMM)
- National Institute of Geography (IGN)
- National Center of Remote sensing (CENATEL)
- Direction of Environment and Climate (DGEC)
- National Direction of Water (DGEau)
- National Direction of Mines
- National Institute of Statistics and Economic
- Safety Agency for Air Navigation in Africa (ASECNA)
- National Meteorological Agency (ANM)
- University of Abomey-Calavi
- The International Chair in Mathematical Physics and Applications (CIPMA-Chaire UNESCO)
- Laboratory of Applied Ecology (LEA)
- Wetland Research Laboratory (LRZH)
- National Institute of Water (INE)
- Non-Governmental Organizations

Information Production in Aquatic and Marine Research in Benin



As one can see, the production of information in the domain is important in regard to the number of institutions that control the sector. Some organizations like ''Safety Agency for Air Navigation in Africa (ASECNA), General Direction of Cotonou's Port, etc. need information for the smooth running of their activities. Other organizations like IRHOB, and the International Chair in Mathematical Physics and Applications (CIPMA – Chair UNESCO), etc. that are research institutes produce and consume marine and aquatic data. These data are produced in their activities to train, diagnose, prevent or identify sustainable solutions in the field. The immediate consequence of information production is "infobesity," characterized by the incapacity to follow the rhythm of production. This really affects the information access process in Benin. In fact, in this library, information access needs originate from researchers composed of teachers, students and national organizations dependent on environmental, lacustrine and oceanographic data. Those requests sometimes are not easy to satisfy due to unavailability. It is then a challenge, for if we consider that big data are generated by many national organizations, we should be able to build a repository of what is produced, so as to ensure their access in short and long run.

This is what made the library of IRHOB to devise its *''legal deposit''* strategy. The strategy consists in following the national rhythm of aquatic and oceanographic information. The strategy consists of three essentials: Data centralization, partnership with universities and other organizations and international access.

- **Data centralization**

The method here is to concentrate all the research findings of IRHOB. With this strategy, the library updates the institution data and makes them available to users. Some of these data can be accessible online while others are available in print format. Documents in print format are the following:

- Directories of researchers and institutions in marine and coastal sciences;
- Bathymetry of the channel, lake Nokoué, lake Ahémé, and its channels and part of the ocean;
- National and regional marine and coastal atlas;
- Marine fish atlas of commercial interest;
- Digitized Map of Benin continental shelf;
- Several thematic maps on the parameters of the marine and coastal environment;
- Several publications, fact sheets and thematic posters ; etc.

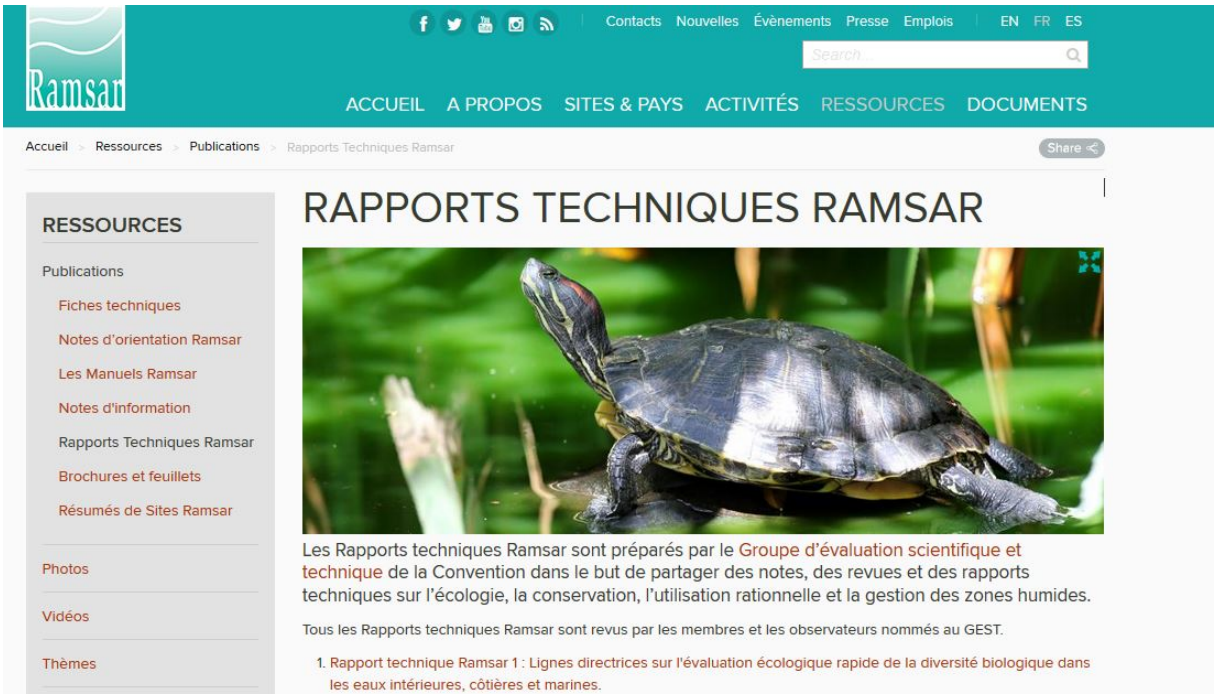
Online data can be found on IRHOB's website: www.nodc-benin.org.

- **Partnerships with Universities and Other Organizations**

The partnerships with academic institutions and other organizations aims at collecing documents (thesis, articles, reports, and other grey literature) produced by lecturers, teachers, researchers, etc. This measure enables the gathering of national academic resources on aquatic and marine sciences. These data are often used by students for academic purpooses. This has been possible thank to a partnership signed between IRHOB and academic institutions, organizations dealing with ocean and aquatic issues.

- **Access to International Data**

IRHOB Library patrons can access international aquatic and marine science resources through the program AGORA which is one of the fifth scientific and technical databases of the program Research4life. It is cordinated by the Food and Agricultural Organization (FAO) and aims at reducing knowledge gap between northern and southern countries. It provides free online access to more than 10,000 reviews and 26,000 books in many disciplines such as: agriculture, veterinary science, biology, biotechnology, chemestry, ecology, environment sciences, natural resources, fishing, acquatic sciences, etc. other sources like RAMSAR Convention.



Conclusion

Whatever the field may be, information availabilty is vital for the smooth running of human activities. This paper discussed strategies used at Benin Institute for Halieutic and Oceanographic Research (IRHOB) to provide access to aquatic and marine sciences informations in Benin.

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